12-31-2016

# Florida Rural Small Business Energy Assistance Collaborative Cumulative Report Ending December 31, 2016

Florida Solar Energy Center

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FLORIDA SOLAR ENERGY CENTER®

*Creating Energy Independence*

# Florida Rural Small Business Energy Assistance Collaborative Cumulative Report Ending December 31, 2016

FSEC-CR-2046-17

Submitted January 31, 2017


**Author**

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**Prepared for**

United States Department of Agriculture
Rural Development
USDA Case No. 09-048-822843791, Grant No. 1




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A Research Institute of the University of Central Florida

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## Introduction

The U.S. Department of Agriculture's (USDA) Rural Development initiative reaches out to communities across America with many programs (http://www.rd.usda.gov/programs-services/all-programs). USDA's Rural Energy for America Program (REAP) offers grants and loan guarantees for energy efficiency improvements and renewable energy systems to agriculture operations and qualifying rural small businesses. USDA has awarded the University of Central Florida a grant to provide a limited number of subsidized Energy Audits to eligible businesses in Florida in support of USDA Rural Development (USDA-RD) Grant and Loan programs for rural small businesses. The ultimate goal of the energy audits is to increase participation in REAP.

Audits are being offered by the Florida Solar Energy Center (FSEC), a non-profit research institute of UCF located in Cocoa, Florida. FSEC conducts energy research for and supports many federal, state, and private agencies; utilities; non-profit housing providers; and other homebuilding and construction industry stakeholders. The audit team includes engineers, an architect, and energy analysts. The grant agreement between UCF and the USDA was signed on March 24, 2015 to be in effect for a two year period. Approximately eight months remain in the grant period.

## Budget and Expenditures

At the time of the Progress Report in July 2016, federal expenditures totaled $47,877.88 with an additional $5,000 in cost share spent. Since then, additional funds have been spent for responding to inquiries from audit/renewable energy assessment candidates, project administration, and reporting. The cumulative total expenditure shown in the Request for Reimbursement through 12/31/16 was $53,310.95 which brings total spending including $5,000 cost share to $58,310.95. The remaining balance is  $45,832.05.

## Recruitment Activity Overview

No further recruitment activity has been conducted since the last report submitted. Copies of various promotional materials are included in Appendix A.

Please see FSEC's webpage that promotes REAP and the availability of subsidized audits here: http://www.fsec.ucf.edu/USDA-REAPenergyaudits (See screen shot, Appendix A, Figure A1.)

A summary of previous recruitment activity is provided in Table 1. The combined reach (number of promotion recipients) from these three strategies was over 7,000. Example fliers and promotions are included in Appendix A.

**Table 1. Overview of Recruitment Activities**

| Status | Organization | Description | Reached |
|---|---|---|---|
| **Outreach using FSEC's internal communications mechanism** | | | |
| Completed | UCF/Florida Solar Energy Center | FSEC blog "The Energy Chronicle", approximately 375 unique users/month | 375 |
| Completed | UCF/Florida Solar Energy Center | FSEC Buildings Research Division e-newsletter, Summer 2015, Autumn 2015, and Spring 2016 editions. 1,470 recipients each mailing | 4,410 |
| Completed | UCF/Florida Solar Energy Center | Distribute to in-house email database of persons interested in renewable energy and/or energy efficiency | 530 |
| **Partnering with organizations that serve small businesses** | | | |
| Completed | Lake Wales Area Chamber of Commerce & Lake Wales Economic Development Council | Email blast to 400 chamber members (99% are small businesses) | 400 |
| Completed | SCORE of Central Florida | Facebook post | 125 |
| Completed | Titusville Area Chamber of Commerce | Email blast | 500 |
| Completed | Small Business Assistance Center of Polk County | email blast, circulate to related organizations, Facebook post | 550 |
| **Partnering with rural electric co-op's and other programs** | | | |
| Completed | All Rural Electric Co-ops in Florida | Direct communication by phone and email | 30 |
| Completed | Clay County Electric Co-op | Include article in 2016 mailer targeting business customers. | Partner did not publish |
| **Partnering with allied programs** | | | |
| Completed | 17 Main Street America programs in cities eligible for REAP funding | Introduction calls to each program. Only a few returned calls. | 17 |
| **Cold call rural small businesses** | | | |
| Completed | Downtown Madison | Door to door distribution of fliers, meet and greet | 25 |
| Completed | Titusville and Palm Bay (Brevard County) | Phone calls, County Commissioners | 15 |

*Continued, next page*

| Status | Organization | Description | Reached |
|---|---|---|---|
| **Presentations at USDA and Florida agriculture events (see bulleted list below)** | | | |
| January 21, 2016 | USDA Energy Symposium, Davenport, FL. J. McIlvaine and with D. Beal. | | 15 |
| February 19, 2016 | State of Florida Rural Economic Development Initiative February Meeting, Madison, FL. J. McIlvaine | | 25 + 25 on webinar |
| February 25, 2016 | USDA Energy Symposium, Brooksville, FL. J. McIlvaine and with D. Beal. | | 20 |
| April 6, 2016 | USDA Energy Symposium, LaBelle, FL. J. McIlvaine and with D. Beal | | 30 |
| June 23, 2016 | Agricultural Energy Workshop, Opportunities to Save Money with Energy Efficiency or Renewable Energy System Projects, University of Florida, Hastings Agricultural Extension Center, Hastings, FL. J. McIlvaine | | 20 |
| | | **Total Direct Reach (approximate)** | **7,112** |

In the spring of 2016, FSEC staff made a concerted effort to forge closer relationships with the Florida RD Area Offices by conducting an introduction call with the REAP contact in each RD Area office in Florida. One or more follow up calls were made to the point of contact at each Florida RD Area Office in the fall of 2016 .

For the Agricultural Energy Workshop, photos from a previous energy audit were presented and are included in Appendix C.

## Status of Audit/Renewable Energy Assessment Candidates

The list below updates the status of audit candidates listed in the July 2016 report.

### *Candidates found to be eligible and qualified that elected not to pursue an audit*

**Name:** Skyo Industries, Inc. (updated)
**Location:** 2 Sunshine Blvd, Ormond Beach, FL 32174
**Nature of Business:** Manufacturer of screw drivers
**Contact:** Warren Anderson (Via Bill McCracken)
**Status:** After an initial site visit identifying roof improvements to reduce heat gain as the primary EEI of interest (lighting and other improvements had recently been made) and one follow-up meeting, Mr. Anderson requested a delay in further discussions. Mr. McCracken indicated health issues were a factor.

**Name:** Blue Sky Farms (updated)
**Location:** 4805 CR 13 S, Elkton, FL 32033
**Nature of Business:** Potato grower
**Contact:** Danny Johns
**Status:** After an initial site visit identifying upgrades to refrigeration as the primary energy efficiency improvement, FSEC received no further correspondence from Mr. Johns.

**Name:** Lipman Family Farms (updated)
**Location:** 125 Roberts Ave East, Immokalee, FL 34142
**Nature of Business:** Multi-crop producer
**Contact:** Kevin Yue, PE
**Status:** FSEC fielded a number of questions from this applicant candidate and provided a qualitative review with suggested considerations for three quotes for $2,000,000+ photovoltaic (PV) system. Review and suggestions were delivered on the phone to Mr. Yue. One of the PV contractors also contacted FSEC to request information on the Technical Report required for projects over $200,000. FSEC provided him with a sample report with protected information redacted. Internal discussions at Lipman Family Farms are preliminary. FSEC provided additional free consulting on how to apply for REAP funding in the form of an example application with protected information redacted. The example application and an excerpt of the example technical report are included in Appendix B. FSEC will include the full redacted Technical Report with the submission of this progress report. USDA is free to use these examples as needed for other purposes. The last communication FSEC received from this candidate indicated that they would not need FSEC to conduct the renewable energy assessment. It seemed that they intended to burden the PV contractor with getting the independent assessment done. FSEC considers this a conflict with the intent of third party assessment. Additionally, FSEC's commission under this USDA grant is to work with REAP applicants directly, not their contractors.

**Name:** C & B Farms (no update)
**Location:** 27320 Co Rd 835, Clewiston, FL 33440
**Nature of Business:** Specialty produce
**Contact:** Krista Pencarinha
**Status:** Business owner intends to expand refrigeration and to install a vacuum refrigeration system which is more efficient than standard split system refrigeration. This technology is outside our scope of expertise; however, we helped the business owner find an engineering firm (Global Refrigeration Solutions) that could conduct the audit for them and offered to work together to produce the required Technical Report. Subsequently, the business owner decided to postpone the refrigeration expansion and possibly apply for REAP grant funding in 2017.

**Name:** Quiet Whisper Assisted Living Facility (no update)
**Location:** 190 SW Derek Glen, Lake City, Florida 32024
**Nature of Business:** Health care
**Contact:** Cicilia Davis (Via Elda Rogers, USDA RD Area 3 Office)
**Status:** Candidate wanted to make energy efficiency improvements. After several discussions of specific improvements and the intended general contractor, Ms Davis signed a Business Owner Agreement signaling readiness to schedule an audit. Subsequently she decided not to submit an application for REAP funding after finding out that the application might not be successful.

### *Candidates found to be eligible that elected not to complete qualifying*

**Name:** PizzaBoyz (no update)
**Location:** 919 Saint Johns Ave, Palatka, Florida 32177
**Nature of Business:** Pizza restaurant
**Contact:** Alex Sharp
**Status:** Eligible, after reading more about solar power, candidate decided not to pursue REAP.

**Name:** Pronto Cleaners (no update)
**Location 1**: 8480 South Florida Ave, Floral City, FL 34436
**Location 2:** 957 Howell Ave., Brooksville, FL 34601
**Nature of Business:** Dry cleaning/laundromat
**Contact:** Bob Riley
**Status:** Candidate wanted to replace existing laundromat equipment with higher efficiency units. After discussions of specific models, the business owner did not show up for a scheduled site meeting (preliminary to the audit) and stopped returning calls possibly because he or his project was found to be ineligible by the local USDA-RD agent. There was some confusion about his eligibility.

**Name:** Poo-fessional Recycled Organics and Land Management (no update)
**Location:** 18510 Tyler Road, Odessa, FL 33556
**Nature of Business:** Recycling and screening unsuitable soils, plant debris, and manure to produce professional grade compost, compactable fill, potting soil, composted topsoil, firewood, and shavings for animal bedding.
**Contact:** Not available
**Status:** After initial discussions of possible building efficiency improvements, the business owner decided to work with the USDA RD Area 5 office to explore other grant and loan programs.

### *Candidates found to be ineligible*

**Name:** Goldenrule Housing & Community Development Corp Inc. (no update)
**Location:** 417 E. 2nd Street, Sanford, FL 32771
**Nature of Business:** Housing Counseling assisting low income families, first time homeowners.
**Contact:** Cynthia Smith
**Status:** Ineligible non-profit organization. Located outside eligible rural area.

**Name:** Affordable Homeownership Foundation Inc. (no update)
**Location:** 5264 Clayton Court #1 & #4, Fort Myers, FL 33907
**Nature of the business:** Non-Profit Housing Agency
**Contact:** Lois M. Healy-CEO
**Status:** Ineligible non-profit organization. Located outside eligible rural area.

**Name:** Sun Country Homes of Florida, Inc. (no update)
**Location:** 1206 Pondella Circle, North Ft Myers, FL 33903
**Nature of business:** Real estate sales
**Contact:** Marion Briggs
**Status:** Located outside eligible rural area.

**Name:** Continental Building Products (no update)
**Location:** 886 N Hwy 17, Palatka, FL 32177
**Nature of Business:** Wall board manufacturer
**Contact:** Sarah Coad (Via Clay County Electric)
**Status:** Eligible location. Does not meet small business criteria.

### *Candidates, Status Unknown*

**Name:** Quail Life Farm and Hatchery (no update)
**Location:** 18510 Tyler Road, Odessa, FL 33556
**Nature of Business:** Quail hatchery and product production
**Contact:** Not Available
**Status:** The business owner intends to expand the refrigerated storage capacity within an existing building and wants to make select a higher-than-standard refrigeration system as well as consider other building improvements to reduce energy consumption. After initial discussions, we learned that the business owners may have had financial history that disqualified them from REAP eligibility. The business may have been able to resolve those and submit a REAP application; however, FSEC did not conduct an audit and was not involved in their application.

## Conclusion

Following submission of the July report, FSEC requested a conference call with Florida USDA Rural Development management. Considering that 16 months into the grant, only three of the anticipated 26 audits had been performed despite extensive efforts to recruit audit candidates that resulted in outreach of approximately 7,000 discrete, individual touch points. In such cases, we must ask ourselves why anticipated results did not materialize. One unanticipated factor was that the nature of the REAP application requirements are such that the independent energy audits and solar resource assessments are not required if the total project cost is less than $200,000. Instead, applicants may use calculations produced by the vendor(s) involved in the project. This rule likely increases participation in the program and serves both USDA and applicants well; However, it narrows the field of applicants that need a third party audit or solar assessment to those businesses with both the financial means and the organizational capacity to undertake an extensive building renovation and/or renewable energy installation – one that is over $200,000 in total project cost. This means that the 25% share of the total cost that the applicant must bring to the table from a non-USDA source is at a minimum $50,000, perhaps a bigger challenge for small businesses and agriculture entities.

While the portion of UCF grant funds budgeted for promotion and recruiting have been depleted, grant funds budgeted for conducting audits/assessments, producing the required technical reports, and supporting applicants, including travel funds, have been set aside. During the conference call on October 24, 2016, Florida USDA RD management and the University of Central Florida Office of Research and Commercialization agreed that those funds will go back to USDA if no audit candidates come forward for the spring application cycle. As it stands, no applicants have come forward.

As an entity of the Florida's State University System, FSEC is always eager to see Floridians participate in funding opportunities like REAP to the benefit of our - businesses and consumers alike. We will continue to field inquiries and direct potential applicants to the USDA RD Area Offices; however, UCF will take steps in the near future to draw this grant to a close without spending the full grant amount.

**More Information**

Please direct inquiries to

Janet McIlvaine, Sr. Research Analyst
FSEC Buildings Research Division
1679 Clearlake Rd
Cocoa, FL 32922
321-638-1434
janet@fsec.ucf.edu

## Appendices

# Appendix A – Promotional and Recruitment Materials

Figure A1 (3 pages): Email blast (p. A1) to an FSEC database of 530 recipients about REAP with links to FSEC's REAP webpage located at: http://www.fsec.ucf.edu/USDA-REAPenergyaudits and screen shots of the page (pp. A2-A3).

From Janet McIlvaine <janet@fsec.ucf.edu>
Subject **USDA Subsidized Energy Audit**
To janet@fsec.ucf.edu

**USDA Subsidized Energy Audits**
**For Eligible Small Businesses in Rural Florida* Communities**

The U.S. Department of Agriculture's (USDA) offers grants and loans for renewable energy systems & energy efficiency improvements to qualifying rural small businesses and agriculture operations through the Rural Energy for America Program (REAP). USDA chose the University of Central Florida (UCF) to perform a limited number of heavily subsidized energy audits in Florida to support the loan and grant programs. Businesses must meet location, size, and other eligibility criteria to be considered for an energy audit. Energy audits will be conducted by experienced staff at UCF's Florida Solar Energy Center (FSEC). FSEC is a nonprofit, UCF research institute that conducts research for and supports many federal, state, and private agencies. FSEC staff can help determine eligibility, answer questions about the subsidized energy audits being offered in Florida, and provide USDA contacts.

To be considered for a subsidized energy audit for your rural small business, contact Janet McIlvaine:

- Email**: janet@fsec.ucf.edu
- Subject: REAP energy audits, <insert business name>
- Include the following:
  - Business name
  - Address of the building(s) to be audited (must be in Florida*)
  - General nature of the business (retail, health care, restaurant, pharmacy, etc.)
  - Your name, title, phone number, and best contact time

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*For more information about the audit and links to USDA resources*:
http://blog.floridaenergycenter.org/echronicle/2015/06/usda-energy-audits/

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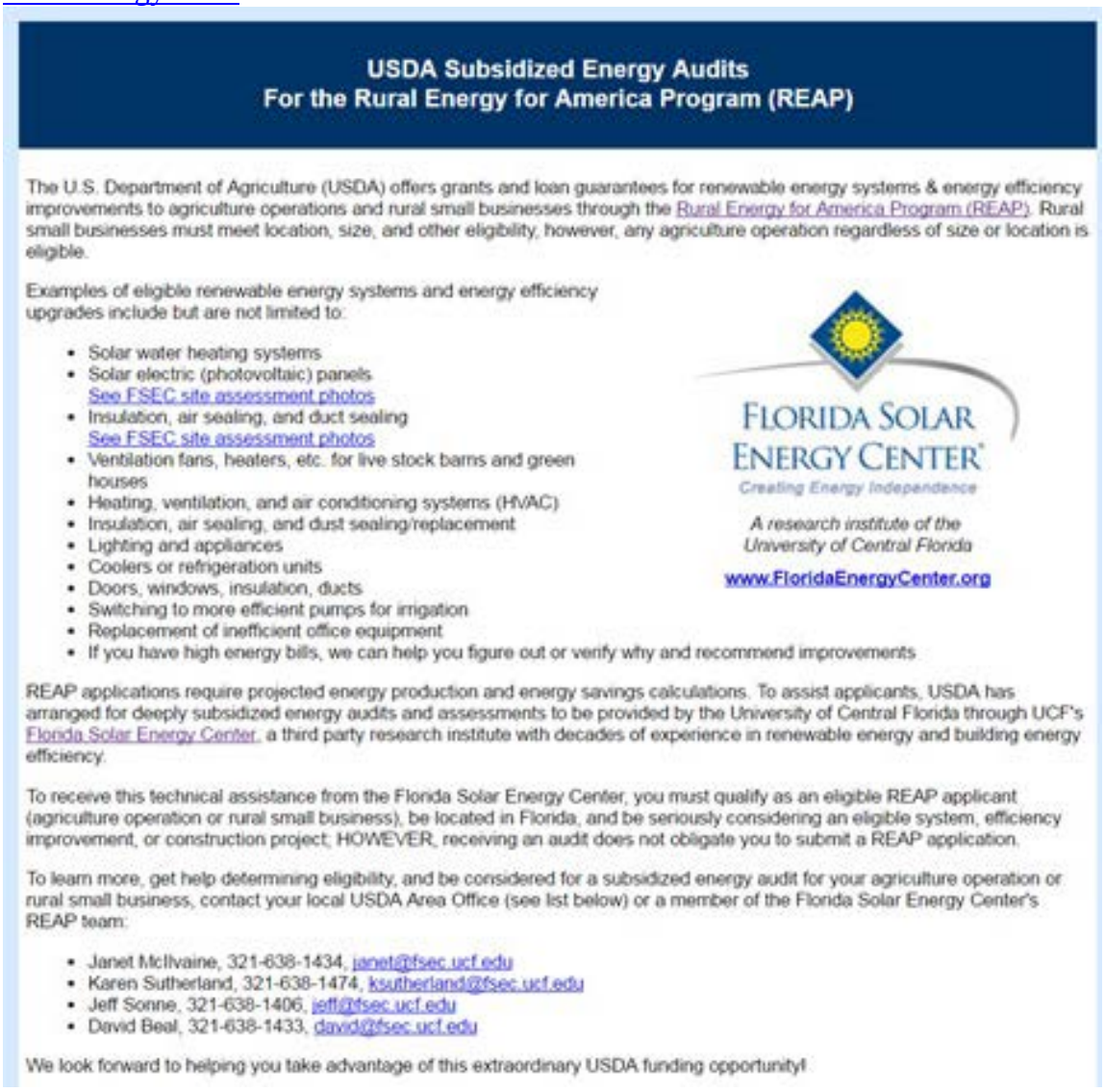
*Concerned this might be spam?* Google "USDA Press Release No. 0107.15" to see the official announcement. UCF is on the "list of recipients" linked near the bottom of the release.

*Explore example projects:* http://farmenergy.org/success-stories/energy-efficiency
YOU too can play a role in America's energy independence.

**Not in Florida? Contact your state or local USDA office:* http://www.rd.usda.gov/browse-state
***Not an email user? Contact Janet McIlvaine at 321-638-1434.*

Screen shot of top of FSEC's REAP webpage located at: http://www.fsec.ucf.edu/USDA-REAPenergyaudits



## USDA Subsidized Energy Audits
## For the Rural Energy for America Program (REAP)

The U.S. Department of Agriculture (USDA) offers grants and loan guarantees for renewable energy systems & energy efficiency improvements to agriculture operations and rural small businesses through the Rural Energy for America Program (REAP). Rural small businesses must meet location, size, and other eligibility, however, any agriculture operation regardless of size or location is eligible.

Examples of eligible renewable energy systems and energy efficiency upgrades include but are not limited to:

- Solar water heating systems
- Solar electric (photovoltaic) panels
  See FSEC site assessment photos
- Insulation, air sealing, and duct sealing
  See FSEC site assessment photos
- Ventilation fans, heaters, etc. for live stock barns and green houses
- Heating, ventilation, and air conditioning systems (HVAC)
- Insulation, air sealing, and dust sealing/replacement
- Lighting and appliances
- Coolers or refrigeration units
- Doors, windows, insulation, ducts
- Switching to more efficient pumps for irrigation
- Replacement of inefficient office equipment
- If you have high energy bills, we can help you figure out or verify why and recommend improvements

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REAP applications require projected energy production and energy savings calculations. To assist applicants, USDA has arranged for deeply subsidized energy audits and assessments to be provided by the University of Central Florida through UCF's Florida Solar Energy Center, a third party research institute with decades of experience in renewable energy and building energy efficiency.

To receive this technical assistance from the Florida Solar Energy Center, you must qualify as an eligible REAP applicant (agriculture operation or rural small business), be located in Florida, and be seriously considering an eligible system, efficiency improvement, or construction project; HOWEVER, receiving an audit does not obligate you to submit a REAP application.

To learn more, get help determining eligibility, and be considered for a subsidized energy audit for your agriculture operation or rural small business, contact your local USDA Area Office (see list below) or a member of the Florida Solar Energy Center's REAP team:

- Janet McIlvaine, 321-638-1434, janet@fsec.ucf.edu
- Karen Sutherland, 321-638-1474, ksutherland@fsec.ucf.edu
- Jeff Sonne, 321-638-1406, jeff@fsec.ucf.edu
- David Beal, 321-638-1433, david@fsec.ucf.edu

We look forward to helping you take advantage of this extraordinary USDA funding opportunity!

Screen shot of bottom of FSEC's REAP webpage located at: http://www.fsec.ucf.edu/USDA-REAPenergyaudits

To receive this technical assistance from the Florida Solar Energy Center, you must qualify as an eligible REAP applicant (agriculture operation or rural small business), be located in Florida, and be seriously considering an eligible system, efficiency improvement, or construction project; HOWEVER, receiving an audit does not obligate you to submit a REAP application.

To learn more, get help determining eligibility, and be considered for a subsidized energy audit for your agriculture operation or rural small business, contact your local USDA Area Office (see list below) or a member of the Florida Solar Energy Center's REAP team:

- Janet McIlvaine, 321-638-1434, janet@fsec.ucf.edu
- Karen Sutherland, 321-638-1474, ksutherland@fsec.ucf.edu
- Jeff Sonne, 321-638-1406, jeff@fsec.ucf.edu
- David Beal, 321-638-1433, david@fsec.ucf.edu

We look forward to helping you take advantage of this extraordinary USDA funding opportunity!

**REAP Contacts at USDA's Rural Development Area Offices in Florida***

Area 1, Crestview (850) 682-2416
Ms. Jennifer Dillard (ext 128), Jennifer.Dillard@fl.usda.gov
Escambia, Holmes, Okaloosa, Santa Rosa, and Walton Counties.

Area 2, Marianna (850) 526-2610
Ms. Lona Philips, Lona.Phillips@fl.usda.gov or any member of the REAP team
Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Wakulla, and Washington Counties.

Area 3, Lake City (386) 719-5590
Ms. Elda Rogers (ext 110), Elda.Rogers@fl.usda.gov
Baker, Bradford, Clay, Columbia, Duval, Hamilton, Lafayette, Madison, Nassau, Suwannee, St. Johns, Taylor, and Union Counties.

Area 4, Ocala (352) 732-7534
Ms. Danelle Ehlers (ext 121), danelle.ehlers@fl.usda.gov
Alachua, Citrus, Dixie, Flagler, Gilchrist, Lake, Levy, Marion, Putnam, Seminole, Sumter, and Volusia Counties.

Area 5, Davenport (863) 420-4833
Ms. LaTasha Thomas-Pace (ext 118), Latasha.ThomasPace@fl.usda.gov
Brevard, Hernando, Hillsborough, Indian River, Orange, Osceola, Pasco, Pinellas, and Polk Counties.

Area 6, Royal Palm Beach (561) 792-2727
Ms. Yashira Mendez (ext 130), Yashira.Mendez@fl.usda.gov
Broward, Dade, Glades, Hendry, Highlands, Martin, Monroe, Okeechobee, Palm Beach, St. Lucie, Charlotte, Collier, DeSoto, Hardee, Lee, Manatee, and Sarasota Counties.

*Note: The above list of REAP Specialists was compiled in February of 2016 for reference and convenience of potential REAP applicants in Florida by the Florida Solar Energy Center. Specialists noted above are subject to change and may be only one of an Area Office's REAP team.*

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*Not in Florida? Contact your state or local USDA office: http://www.rd.usda.gov/browse-state

The Energy Chronicle
A Newsletter of the Florida Solar Energy Center

« New Florida Energy Code Effective June 30, 2015. Sign Up for the Training You Need; Limited Time Discount Available

# Energy Audits for Rural Small Businesses

Revised June 10, 2015

The U.S. Department of Agriculture (USDA) Rural Energy for America Program (REAP) offers Renewable Energy Systems & Energy Efficiency Improvement Loans & Grants to rural small businesses. USDA chose the University of Central Florida's FSEC to provide a limited number of subsidized building energy audits to small businesses in rural Florida communities who are eligible for the grants and loans. Audit candidates must also meet FSEC criteria, which will be determined by a phone interview.

A limited number of subsidized building energy audits will be available to small businesses in rural Florida communities. Photo: ThinkStock.com

**What is a building energy audit?** An energy audit is an assessment of the energy use and energy saving opportunities in a building. The business or building owners play a role in the audit by providing utility bills and getting quotes for the improvements to facilitate cost-benefit calculations. The audit report provides recommendations and calculations that help applicants complete the technical sections of the Renewable Energy Systems & Energy Efficiency Improvement Loan & Grant applications.

**Action Item:** To be considered for a subsidized energy audit of the



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» April 2014

Figure A2. Excerpt from the FSEC blog post announcing the audit opportunity on June 5, 2015 revised June 10, 2015. http://blog.floridaenergycenter.org/echronicle/2015/06/usda-energy-audits/

**Subject:** Re: Grant opportunity for small businesses
**From:** Karen Sutherland <ksutherland@fsec.ucf.edu>
**Date:** 6/25/2015 11:37 AM
**To:** "Decaminada, Dawn" <dawn@cfdc.org>
**CC:** Janet McIlvaine <janet@fsec.ucf.edu>

This is great. Big thanks Dawn!

On 6/24/2015 11:04 AM, Decaminada, Dawn wrote:

> The Polk County Small Business Assistance Center is pleased to share the following opportunity to Polk County rural small businesses.
> The U.S. Department of Agriculture's (USDA) Rural Development initiative reaches out to communities across America with many programs (http://www.rd.usda.gov/programs-services/all-programs). USDA's Rural Energy for America Program offers grants and loans for energy efficiency improvements and renewable energy systems to agriculture operations and qualifying rural small businesses.
>
> - Example energy improvements include adding insulation, window tinting, high-efficiency lighting, refrigeration unit and air conditioner replacement.
> - An energy audit is required. USDA has chosen the University of Central Florida to provide a limited number of subsidized energy audits to eligible businesses in Florida.
> - Audits will be conducted by staff at the Florida Solar Energy Center (FSEC), a non-profit research institute of UCF located in Cocoa, FL.
> - FSEC conducts energy research for and supports many federal, state, and private agencies.
> - FSEC staff can help determine eligibility for USDA's grants and loans, a prerequisite to receive a subsidized energy audit.
>
> Contact Janet McIlvaine: at janet@fsec.ucf.edu (preferred) or 321-638-1434. Please make your email subject "REAP energy audits, <insert your business name>" and in the email include the business name, address to be audited, general nature of the business (retail, health care, restaurant, pharmacy, etc.), and your contact information.
> See FSEC's Blog post for more information http://blog.floridaenergycenter.org/echronicle/2015/06/usda-energy-audits/
>
> Sincerely,
> Dawn Decaminada
>
> Small Business ASSISTANCE CENTER
> Supervisor
> Small Business Assistance Center
> 330 West Church St.
> Bartow, Florida 33830
> **Office**: 863-534-5921
> **Cell**: 863-344-1558
> **Fax**: 863-534-5932
> **Web**: www.cfdc.org/sbac

Figure A3. Email blast from the Small Business Assistance Center of Polk County. Similar text was provided to the Titusville Chamber of Commerce, Lake Wales Area Chamber of Commerce, and the Lake Wales Economic Development Council.

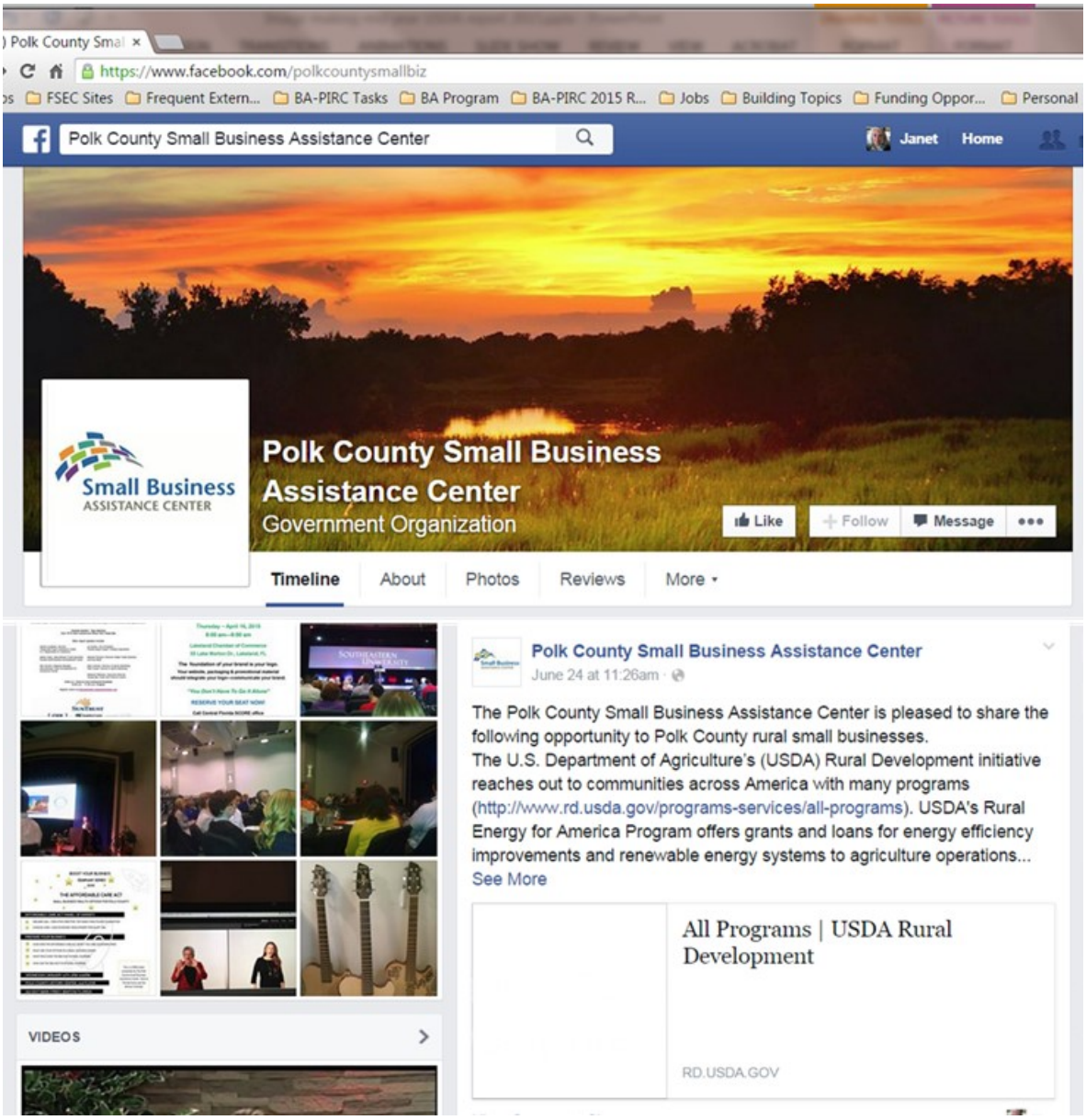



Figure A4. Facebook post by the Small Business Assistance Center of Polk County specifically promoting the REAP Energy Audit opportunity and USDA Rural Development programs.

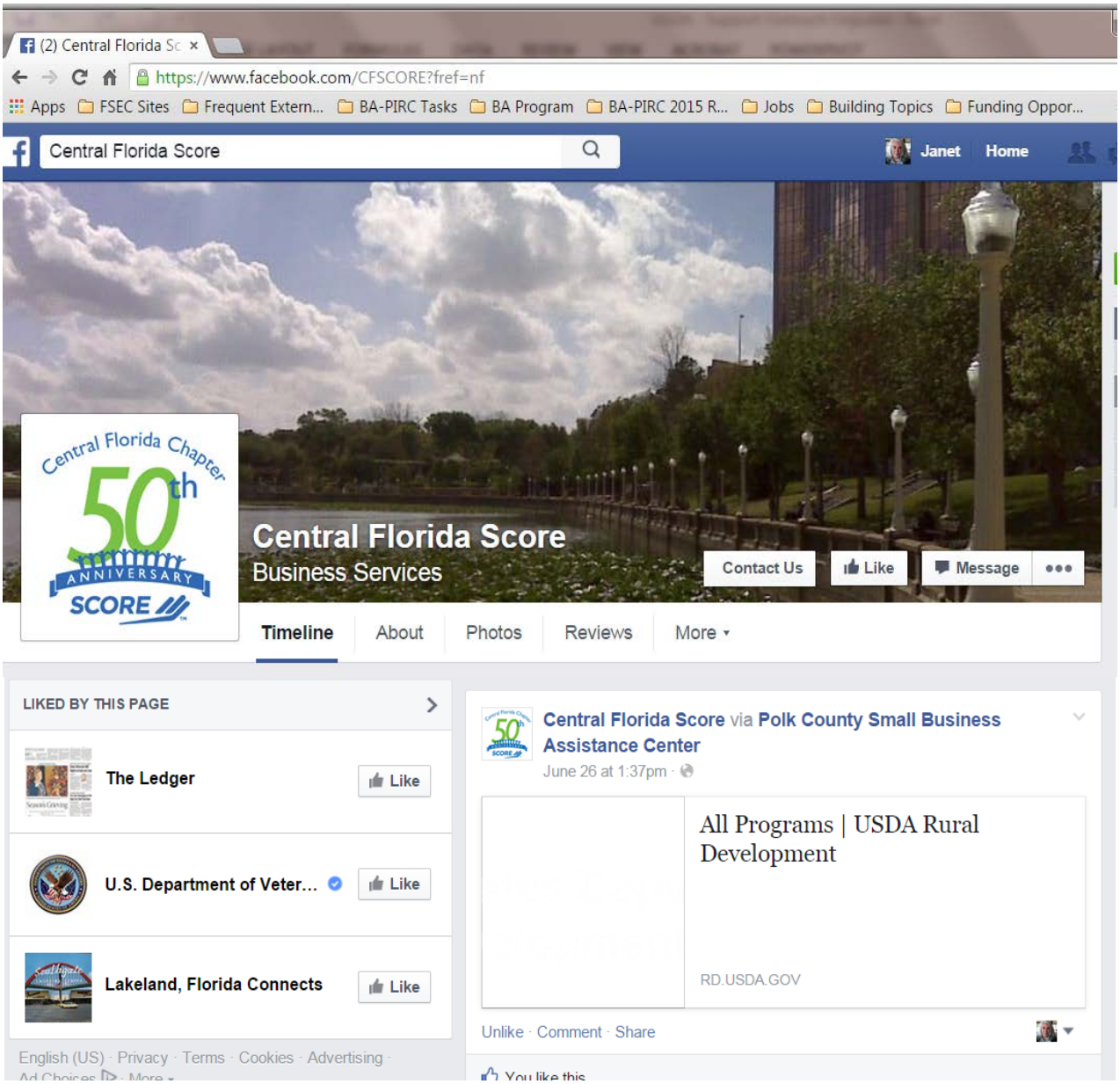
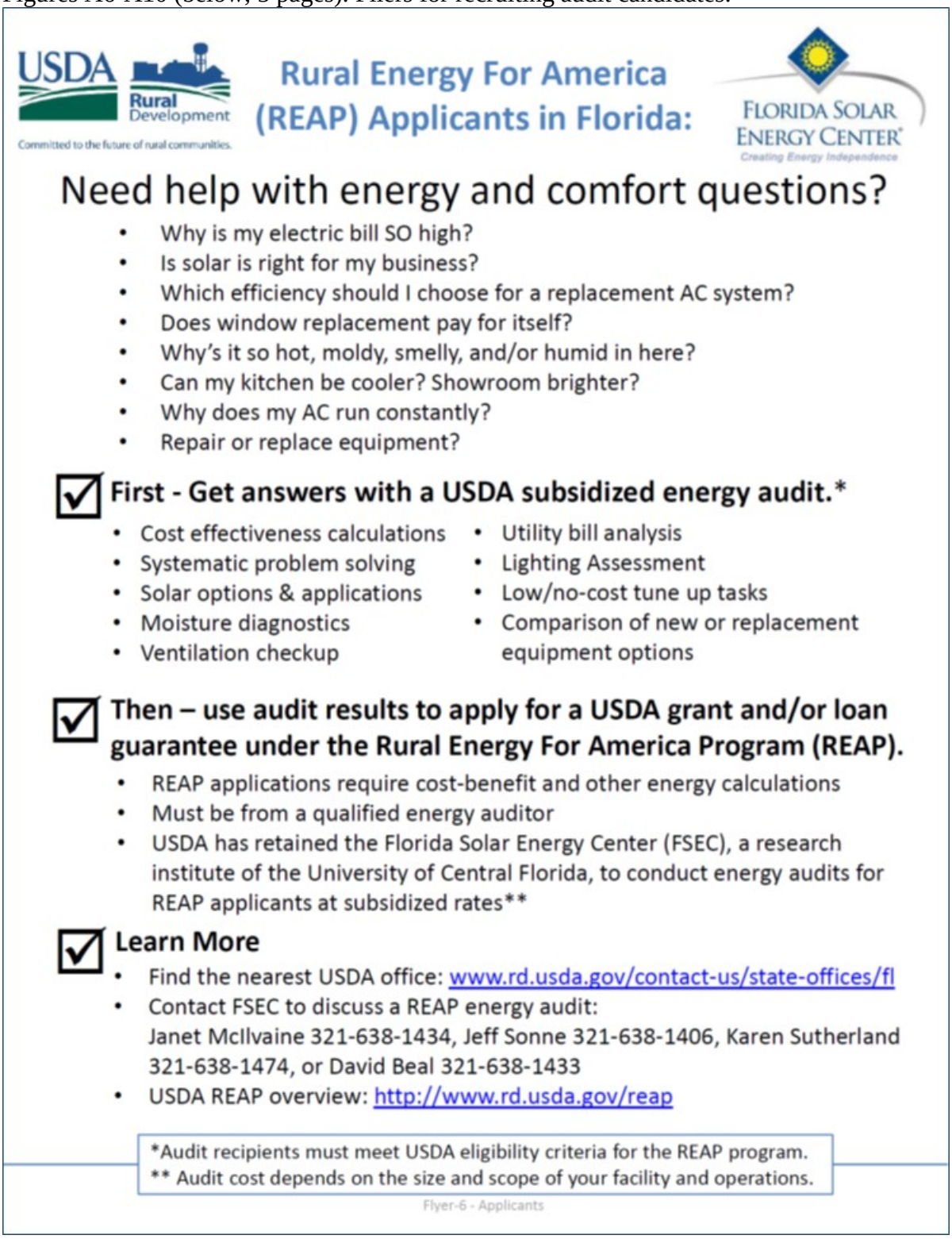



Figure A5. Facebook Post by SCORE of Central Florida providing a link to USDA Rural Development programs.

Figures A6-A10 (below, 5 pages). Fliers for recruiting audit candidates.



USDA Rural Development
Committed to the future of rural communities.

# Rural Energy For America (REAP) Applicants in Florida:

FLORIDA SOLAR ENERGY CENTER
Creating Energy Independence

## Need help with energy and comfort questions?

- Why is my electric bill SO high?
- Is solar is right for my business?
- Which efficiency should I choose for a replacement AC system?
- Does window replacement pay for itself?
- Why's it so hot, moldy, smelly, and/or humid in here?
- Can my kitchen be cooler? Showroom brighter?
- Why does my AC run constantly?
- Repair or replace equipment?

### ☑ First - Get answers with a USDA subsidized energy audit.*

- Cost effectiveness calculations
- Systematic problem solving
- Solar options & applications
- Moisture diagnostics
- Ventilation checkup
- Utility bill analysis
- Lighting Assessment
- Low/no-cost tune up tasks
- Comparison of new or replacement equipment options

### ☑ Then – use audit results to apply for a USDA grant and/or loan guarantee under the Rural Energy For America Program (REAP).

- REAP applications require cost-benefit and other energy calculations
- Must be from a qualified energy auditor
- USDA has retained the Florida Solar Energy Center (FSEC), a research institute of the University of Central Florida, to conduct energy audits for REAP applicants at subsidized rates**

### ☑ Learn More

- Find the nearest USDA office: www.rd.usda.gov/contact-us/state-offices/fl
- Contact FSEC to discuss a REAP energy audit:
  Janet McIlvaine 321-638-1434, Jeff Sonne 321-638-1406, Karen Sutherland 321-638-1474, or David Beal 321-638-1433
- USDA REAP overview: http://www.rd.usda.gov/reap

*Audit recipients must meet USDA eligibility criteria for the REAP program.
** Audit cost depends on the size and scope of your facility and operations.

Flyer-6 - Applicants

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UCF
Stands For Opportunity

## Agriculture Producers & Rural Small Business Owners:

The USDA has grants and loan guarantees for renewable energy and energy efficiency improvements. Find out how the Rural Energy for America Program (REAP) can help you improve facilities and operation cost.

## This program may be right for your business if you…

- Need to reduce electric bills
- Plan to replace AC, coolers, ventilation, lighting, major equipment
- Are considering solar power for ventilation fans, pumping, or lighting
- Have to replace windows or plan to add on to an existing building
- Need to improve comfort, lighting quality, ventilation, or pumping

## ☑ Get the facts about USDA's Rural Energy For America Program

1. USDA REAP overview: http://www.rd.usda.gov/reap
2. Ask for the REAP specialist at the USDA Rural Development Office nearest you:
   - Crestview (850) 682-2416
   - Marianna (850) 526-2610
   - Lake city (386) 719-5590
   - Ocala (352) 732-7534
   - Davenport (863) 420-4833
   - Royal palm beach (561) 792-2727
   - North ft. Myers (239) 997-7331

## ☑ Get the facts on the energy audit required for REAP funding

1. Applications require cost-benefit & other calculations
2. Must be done by a qualified energy auditor
3. USDA has subsidize the Florida Solar Energy Center (FSEC) at the University of Central Florida (UCF) to conduct audits for REAP candidates*
4. Contact an FSEC auditor to learn more:
   - Janet McIlvaine 321-638-1434
   - Karen Sutherland 321-638-1474
   - Jeff Sonne 321-638-1406
   - David Beal 321-638-1433

*Audit recipients must meet USDA eligibility criteria for REAP. Audit cost depends on the size and scope facility, operations, and improvement plans.

Flyer-6 - General

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Creating Energy Independence
A Research Institute of the University of Central Florida

UCF
Stands For Opportunity

## USDA Rural Energy for America Program (REAP) partners with UCF

The U.S. Department of Agriculture (USDA) offers grants and loan guarantees for renewable energy systems & energy efficiency improvements to agriculture operations and rural small businesses through the Rural Energy for America Program (REAP). Rural small businesses must meet location, size, and other eligibility criteria however, any agriculture operation regardless of size or location is eligible. For a program overview, please visit USDA's REAP webpage: http://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

Examples of eligible renewable energy systems and energy efficiency upgrades include but are not limited to:

- Heating, ventilation and air conditioning systems (HVAC)
- Insulation, air sealing, and duct sealing/replacement
- Lighting and appliances
- Solar electric (photovoltaic) panels
- Ventilation fans, heaters, etc for livestock barns and green houses
- High efficiency and solar water heating systems
- Coolers or refrigeration units
- Doors, windows, insulation, ducts
- Switching to more efficient pumps for irrigation
- Replacement of inefficient office equipment
- If you have high energy bills, we can help you figure out or verify why and recommend improvements

REAP applications require projected energy production and energy savings calculations. To assist applicants in Florida, USDA has arranged for deeply subsidized energy audits and assessments to be provided by the University of Central Florida through UCF's Florida Solar Energy Center, a third party research institute with decades of experience in renewable energy and building energy efficiency.(www.floridaenergycenter.org) .

To receive this technical assistance from the Florida Solar Energy Center, you must qualify as an eligible REAP applicant (ag operation or rural small business), be located in Florida, and be seriously considering an eligible system, efficiency improvement, or construction project; HOWEVER, receiving an audit does not obligate you to submit a REAP application.

To learn more, get help determining eligibility, and be considered for a subsidized energy audit for your agriculture operation or rural small business, contact your local USDA Area Office (see list below) or a member of the Florida Solar Energy Center's REAP team:

- Janet McIlvaine, 321-638-1434, janet@fsec.ucf.edu
- Karen Sutherland, 321-638-1474, ksutherland@fsec.ucf.edu
- Please include "USDA" in the subject line to ensure your email does not get caught in the spam filter.
- Info page: http://www.fsec.ucf.edu/USDA-REAPenergyaudits

We look forward to helping you take advantage of this extraordinary USDA funding opportunity!

**REAP Contacts at USDA's Rural Development Area Offices in Florida***

Area 1, Crestview (850) 682-2416
Ms. Jennifer Dillard (ext 128), Jennifer.Dillard@fl.usda.gov
*Serving Escambia, Holmes, Okaloosa, Santa Rosa, and Walton Counties.*

Area 2, Marianna (850) 526-2610
Ms. Loria Philips, Loria.Phillips@fl.usda.gov, or any member of the REAP team
*Serving Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Wakulla, and Washington Counties.*

Area 3, Lake city (386) 719-5590
Ms. Elda Rogers (ext 110), Elda.Rogers@fl.usda.gov
*Serving Baker, Bradford, Clay, Columbia, Duval, Hamilton, Lafayette, Madison, Nassau, Suwannee, St. Johns, Taylor, and Union Counties.*

Area 4, Ocala (352) 732-7534
Danielle Ehlers (352) 732-7534 ext 121, danielle.ehlers@fl.usda.gov
*Serving Alachua, Citrus, Dixie, Flagler, Gilchrist, Lake, Levy, Marion, Putnam, Seminole, Sumter, and Volusia Counties.*

Area 5, Davenport (863) 420-4833
Ms. LaTasha Thomas-Pace (ext 118), Latasha.ThomasPace@fl.usda.gov
*Serving Brevard, Hernando, Hillsborough, Indian River, Orange, Osceola, Pasco, Pinellas, and Polk Counties.*

Area 6, Royal Palm Beach
(561) 792-2727 - Ms. Yashira Mendez (ext 130) Yashira.Mendez@fl.usda.gov
*Serving Broward, Dade, Glades, Hendry, Highlands, Martin, Monroe, Okeechobee, Palm Beach, St. Lucie, Charlotte, Collier, DeSoto, Hardee, Lee, Manatee, and Sarasota Counties.*

Note: The above list of REAP Specialists was compiled in February of 2016 for reference and convenience of potential REAP applicants in Florida by the Florida Solar Energy Center. Specialists noted above are subject to change and may be only one of an Area Office's REAP team.

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**Not in Florida? Contact your state or local USDA office: http://www.rd.usda.gov/browse-state*

FLORIDA SOLAR ENERGY CENTER®

*Creating Energy Independence*

A Research Institute of the University of Central Florida


## Who We Are

The Florida Solar Energy Center (FSEC) is the largest and most active state-supported renewable energy and energy efficiency research, training and certification institute in the United States. FSEC is a non-profit research institute of the University of Central Florida established in 1975. Researchers specialize in alternative energy (solar electric, solar thermal, and hydrogen) and building energy efficiency for the hot-humid climate. FSEC is located on a 20-acre research complex on Florida's Space Coast at UCF's Cocoa Campus, 35 miles east of Orlando. Learn more about FSEC's current work and history, please visit www.floridasenergycenter.org

## What We Do

The Center's professional staff of 60 has expertise in engineering, energy research, building science, energy and policy analysis, and education and training with 30 technical, administrative, and student support staff. The Center has gained national and international recognition for its wide range of research, education, training and certification activities including:

- Zero-energy and zero-energy ready buildings
- Applied building science
- Building failure diagnostics
- Laboratory and field experiments with construction processes, components, and equipment
- Utility demand side management research
- Building simulation software development and calibration with measured data
- Photovoltaic (solar electric) systems
- Solar thermal (water heating) systems
- Hydrogen from renewable resources
- Photoelectrochemical processes
- Alternative-fueled vehicles

FSEC annually receives $3 million in operating funds from the State of Florida which is supplemented by $5 million to $8 million in contracts and grants from federal, state, non-profit, and private entities for research, training, and services. Total funding since FSEC's inception in 1975 exceeds $225 million.

## FSEC Buildings Research

The Buildings Research Division specializes in measured energy use and savings in occupied buildings and highly instrumented laboratories, computer simulation software, home energy rating industry leadership, and technical assistance to the construction industry through programs such as the U.S. Department of Energy funded Building America Partnership for Improved Residential Construction. In 2015, the U.S. Department of Agriculture selected FSEC to provide energy audits to agriculture operations and rural small businesses. Other research efforts are developed in partnership with builders, contractors, manufacturers, nonprofit organizations, private sponsors and national laboratories. Results are widely disseminated through industry and trade journals, national and local media and available free at: http://www.fsec.ucf.edu/en/publications/publist.php?dept=br

www.fsec.ucf.edu 321-638-1000 1679 Clearlake Road, Cocoa, FL 32922

Figure A11 (below, 2 pages). Article written for but not used by Clay County Electric Co-op



## UCF providing subsidized energy audits to agriculture operations and small, rural businesses applying for USDA energy efficiency improvement and renewable energy grants and loan guarantees

The University of Central Florida (UCF) has partnered with the U.S. Department of Agriculture (USDA) to provide subsidized energy audits to agriculture operations and small, rural businesses applying for USDA grants and loan guarantees for energy efficiency improvements and renewable energy installations through the Renewable Energy for America Program (REAP). Rural small businesses must meet location, size, and other eligibility criteria however, any agriculture operation regardless of size or location is eligible. For a program overview, please visit USDA's REAP webpage:

http://www.rd.usda.gov/programs-services/rural-energy-america-program-renewable-energy-systems-energy-efficiency

If you have high energy bills, we can help you figure out or verify why and recommend improvements! Examples of eligible energy efficiency upgrades include but are not limited to:

- Ventilation fans, heaters, etc for livestock barns and green houses
- Heating, ventilation and air conditioning systems (HVAC)
- Insulation, air sealing, and duct sealing/replacement
- Lighting and appliances
- High efficiency and solar water heating systems
- Coolers or refrigeration units
- Doors, windows, insulation, ducts
- Switching to more efficient pumps for irrigation
- Replacement of inefficient office equipment

Renewable energy installations (such as solar electric panels) also qualify under the REAP program.

REAP applications require projected energy production and energy savings calculations. To assist applicants, USDA has arranged for deeply subsidized energy audits and assessments to be provided by the Florida Solar Energy Center, a research institute of the University of Central Florida (www.floridaenergycenter.org).

To receive this technical assistance from the UCF's Florida Solar Energy Center, you must qualify as an eligible REAP applicant (ag operation or rural small business), be located in Florida, and be seriously considering an eligible system, efficiency improvement, or construction project; HOWEVER, receiving an audit does not obligate you to submit a REAP application.

To learn more, get help determining eligibility, and be considered for a subsidized energy audit for your rural small business or agriculture operation, contact a member of the Florida Solar Energy Center's REAP team:

- **Janet McIlvaine, 321-638-1434, janet@fsec.ucf.edu**
- **Karen Sutherland, 321-638-1474, ksutherland@fsec.ucf.edu**

*Please include "USDA" in the subject line to ensure your email is not caught in the spam filter.*

We look forward to helping you take advantage of this extraordinary USDA funding opportunity!

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**REAP Contacts at USDA's Rural Development Area Offices in Florida:***

Area 1, Crestview office: **Escambia, Holmes, Okaloosa, Santa Rosa, and Walton Counties.**
Ms. Jennifer Dillard (850) 682-2416 (ext 128), Jennifer.Dillard@fl.usda.gov

Area 2, Marianna office: **Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Wakulla, and Washington Counties.**
Ms. Loria Philips (850) 526-2610, Loria.Phillips@fl.usda.gov or any member of the REAP team

Area 3, Lake City office: **Baker, Bradford, Clay, Columbia, Duval, Hamilton, Lafayette, Madison, Nassau, Suwannee, St. Johns, Taylor, and Union Counties**.
Ms. Elda Rogers (386) 719-5590 (ext 110), Elda.Rogers@fl.usda.gov

Area 4, Ocala office: **Alachua, Citrus, Dixie, Flagler, Gilchrist, Lake, Levy, Marion, Putnam, Seminole, Sumter, and Volusia Counties.**
Danielle Ehlers (352) 732-7534 (ext 121)

Area 5, Davenport office: **Brevard, Hernando, Hillsborough, Indian River, Orange, Osceola, Pasco, Pinellas, and Polk Counties.**
Ms. LaTasha Thomas-Pace (863) 420-4833 (ext 118), Latasha.ThomasPace@fl.usda.gov

Area 6, Royal Palm Beach office: **Broward, Dade, Glades, Hendry, Highlands, Martin, Monroe, Okeechobee, Palm Beach, St. Lucie, Charlotte, Collier, DeSoto, Hardee, Lee, Manatee, and Sarasota Counties.**
Ms. Yashira Mendez (561) 792-2727 (ext 130) Yashira.Mendez@fl.usda.gov

*Note: The above list of REAP Specialists was compiled in February of 2016 for reference and convenience of potential REAP applicants in Florida by the Florida Solar Energy Center. Specialists noted above are subject to change and may be only one of an Area Office's REAP team.*

# Appendix B – Excerpts from Example Application and Technical Report (Redacted to Remove Protected Information)

The excerpts below are from an example application produced by FSEC for a solar electric photovoltaic array project using the $200,000 and over application. The full example application is being submitted as a companion to this report.

Section V, Item A – Item E:

**V. Technical Report - Type of Project (check one):** *(See FMI for descriptions.)*

Renewable Energy System ■ (Complete Block VI) which is either an Energy Generation System ☐ or Energy Replacement System ■ **OR**

Energy Efficiency Improvement ☐ (Complete Block VII):

A. Project Description. Provide a detailed description of the technology, project location, and of the project site:

LOCATION: [redacted], is relocating operations from [redacted] to [redacted].

PROJECT SITE: The existing building facility is a 150' by 80' metal building with a pitched roof sloping at 10 degrees. It consists of 16,000 ft2 of conditioned space split evenly between offices (4000 ft2 upstairs, 4000 ft2 downstairs on the south end of the building) and high bay warehouse/workshop (8,000 ft2). The applicant does not have a site plan or design for the addition but describes it as a simple extension of the high-bay portion of the existing building with similar height and width characteristics and length sufficient to add 14,000 ft2 to the conditioned space.

TECHNOLOGY: The proposed renewable energy system totals 150 kWdc (dc nameplate) grid-tied solar photovoltaic (PV) system with no battery backup. The PV system design shall serve only the power needs of the business with interconnection to grid for any excess power production governed by Florida Power and Light Net Metering Guidelines.

B. Project Construction and Equipment Information. Describe how the design, engineering, testing, and monitoring are sufficient to demonstrate that the proposed project will meet its intended purpose, ensure public safety, and comply with applicable laws, regulations, agreements, permits, codes, and standards. Describe how all equipment required for the Renewable Energy System is available and able to be procured and delivered within the proposed project development schedule.

The proposed renewable energy system for the existing building consists of 470 Canadian Solar 320 watt modules (CSGX - 320P), six Sunny Tripower 24000TL-US (SMA) inverters, and associated components for a complete roof-top, grid-tied PV system mounted on an open frame rack. To ensure public safety, Florida statute requires that all PV systems installed in the state of Florida must have design approval from the Florida Solar Energy Center; therefore, there is a thorough independent review of all design and engineering parameters and specifications prior to permitting. Additionally, all solar energy systems manufactured or sold in the state must meet the standards established by the Florida Solar Energy Center under state statute authority and must display accepted results of approved performance test. All solar power inverters are UL listed. FPL executes the grid connection and ensures all disconnects and controls are adequate to ensure public and utility worker safety. As Florida statute requires, the PV system mounting is designed for a minimum 140 mph structural wind load to meet applicable Florida building codes. All components of the proposed PV system are commercially available, eligible for sale and installation in Florida based on FSEC certification and approval as required by state statute, and readily available in the Florida marketplace. The PV contractor (Florida license number CVC56690) has existing relationships with suppliers and has executed installation of over 200 PV systems over the past 40 years.

C. Commercially Available. A system that meets the requirements of either C or D : (D is for Renewable Energy Systems only)

Proposed domestic or foreign system.

1. Has, for at least 1 year, both a proven and reliable operating history and proven performance data: ☐ Yes ☐ No

   Describe how the technology and project meet this criterion. *(Attach documentation if necessary.)*

   NA - see section D below

2. Is based on established design and installation procedures and practices and is replicable: ☐ Yes ☐ No

D. A domestic or foreign Renewable Energy System that has been certified by a recognized industry organization whose certification standards are acceptable to the Rural Business-Cooperative Service. ■ Yes ☐ No

(Name of recognized industry organization): [redacted]

E. Project Economic Assessment:

all numbers from quote provided by actual solar installer

1. Project Cost Breakdown:

| Construction Item: *(list itemized costs or attach bids)*: | Cost |
|---|---|
| 470 Canadian Solar Panels | $ 378,500 |
| 6 Solar Power Inverters/ Associated installation | $ 23,400 |
| Racking/ Roof Mounting System | $ 22,600 |
| Electrical | $ 12,600 |
| Engineering | $ 3,500 |
| | $ |
| | $ |
| a. Total Project Costs: *(Total Project Costs should be the same as in Form SF-424C, "Budget Information-Construction Programs.")* | $ 440,600 |
| b. Eligible Project Costs: *(See FMI to determine eligible project costs.)* | $ 440,600 |

2. Estimated Project Energy Generation or Savings:

| | |
|---|---|
| a. For Renewable Energy Systems: | |
| i. Annual amount of renewable energy to be generated and unit of energy: | 218189 kWh ■ or BTU ☐ |
| ii. If applicable, historical annual average energy used and unit of measure: The Agency may request additional information to substantiate the above numbers. | 512830 kWh ■ or BTU ☐ |
| iii. Annual percentage of energy being replaced: *If the above number exceeds 100 percent and the system is connected to the grid, the amount of energy above 100 percent will be used in 4c. below. If the amount of energy exceeds 150 percent and the system is connected to the grid, the entire amount of energy generated will be entered in 4c below.* | (i ÷ ii x 100) = 43 % |
| b. For Energy Efficiency Improvement projects: (Complete Block VII first with data from the Energy Audit or Energy Assessment.) Annual amount of energy to be saved and unit of measure: | kWh ☐ or BTU ☐ |

3. Cost of Energy:

| | |
|---|---|
| a. Price per unit of energy paid in prior year: *(This is the retail cost of energy for Renewable Energy System replacement projects and Energy Efficiency Improvement projects.)* | $ 0.14 |
| b. Price per energy unit to be sold to the grid: *(This is the price the utility will pay for energy put onto the grid.)* | $ Not predictable |

4. Energy Value: (See FMI for guidance.)

| | |
|---|---|
| a. Value of energy to be replaced via renewable system (if applicable): (2.a. x 3.a.): | $ 30546 |
| b. Value of energy to be saved via efficiency improvement (if applicable): (2.b. x 3.a.): | $ NA |
| c. Value of energy to be generated and sold to the grid (if applicable): (2.a.. x 3.b.): | $ NA |
| d. Total value of energy replaced/saved/generated: 4a. + 4b. + 4c. = 4d: | $ 30546 |

**Energy Efficiency Improvement projects can proceed to Number 9.**
**Renewable Energy System projects continue to next table.**

| 5. Other annual revenue: (List below. *Such as, sale of byproducts.*) (Do NOT include renewable energy credits, Government or utility incentives, or other incentives.) | | |
|---|---|---|
| Source: | Price/Unit: | Total: |
| NA | $ | $ |
| | $ | $ |
| Total other annual revenue: | | $ |

| | |
|---|---|
| 6. Annual Revenue: (4.d. + 5): | $ 30546 |
| 7. Annual Operating and Maintenance Costs: | $ 400 |
| 8. Earnings before Interest, Taxes, Depreciation, and Amortization (EBITDA): (6-7): | $ 30146 |

| 9. Estimate Simple Payback: | |
|---|---|
| a. Energy replacement and Energy Efficiency Improvement projects: (1. b. ÷ 4.d.): | $ 440,600 ÷ $ 30546 = 14.4 years |
| b. Energy generation projects: (1. b. ÷ 8): | $ 440,600 ÷ $ 30146 = 14.6 years |

Section VI, Item A and Item B

**VI. Renewable Energy System Projects - Technical Requiremets:** *(For Energy Efficiency Improvement Projects Complete Block VII.)* *If Hybrid project, submit specific technical information for each technology.

A. Project Information

1. Will project be interconnected with electric utility grid? ■ Yes ☐ No If yes, name of utility: Florida Power and Light
2. Will the proposed system be connected to a meter that is also connected to a residence? ☐ Yes ■ No
   a. If yes, will 51 percent or more of the energy to be generated from the proposed system be used by the business operation of the Rural Small Business or the Agricultural Producer? ☐ Yes ☐ No

      Amount of energy and unit of measure to be used by the business operation in a typical year?

      kWh ☐ or BTU ☐

   b. If the answer to question 2a. is no, the Applicant certifies that any excess power generated by the Renewable Energy System will be sold to the grid and will not be used by the Applicant for residential purposes. ■ Yes ☐ No
   c. If the answer to question 2b, is no, installation of a second meter (or similar device) that results in all of the energy generated being used for non-residential energy usage or sold to the grid will be required.

B. Renewable Resource Potential: (This information should be part of the feasibility study. Additional information may be requested by the Agency to determine feasibility.)

1. Check which type of renewable energy system is being proposed. Ensure multiple types are checked for hybrid applications:

   Wind ☐ Solar ■ Bioenergy ☐ Geothermal Electric Generation ☐ Geothermal Direct Generation ☐

   Anaerobic Digester ☐ Hydrogen ☐ Hydroelectric/Ocean Energy Projects ☐

2. Provide adequate and appropriate data to demonstrate the amount of renewable resource available. For hybrid projects you must address each technology being proposed. Describe the quality, availability and seasonality (if applicable) of the renewable energy resource:

Analysis conducted for the existing building, as documented with Solmetric SunEye plots and Solmetric Solar Access Summaries indicate the existing building and site have close to optimum solar resource with 85.5% of possible solar energy is incident on the subject roof between solar time 9 am to 3 pm. Based on the project location, roof area (allowing for intra-row spacing, and skylights removal in the roof renovation), and the amount of solar access, a maximum system size is approximately 108.6 kWdc for the existing building. Using NREL's PVWatts online tool (industry-accepted method of estimating PV energy production) and based on project location, module and array type, system losses, roof pitch, solar orientation, dc to ac size ratio, and inverter efficiency, the 108.6 kWdc system would produce approximately 128,012 kWh. This is slightly lower than the PV contractor's predicted production of 142,055 kWh which takes into account the known performance of the chose system components and the intended removal of trees shading the roof. Assessment therefore is found to corroborate the PV contractor's analysis for the existing building and recommends using the contractor's calculations for the full 150 kWdc system.

3. Basis of determination:

There are several methods to determine resource potential on the site, describe below as applicable and attach as necessary:

| | |
|---|---|
| Online Estimating Tool: | ■ Yes; List name of Tool: PVWatts (NREL online tool)<br>☐ No |
| Resource References (Wind Roses, Thematic Maps, etc.): | ☐ Yes; List Resource Reference:<br>■ No |
| Site-Specific Evaluation Devices or Site Surveys: | ■ Yes; List device: Solmetric SunEye, see reports in Appendix G of Technical Report and Feasibility Study document<br>☐ No |
| Photographs of Site: | ■ Yes; Attached to application.<br>☐ No |
| Other: | Attach documentation if applicable. |

4. Agreements and Permits. Describe the necessary agreements and permits (including any for local zoning requirements) required for the project and the anticipated schedule for securing those agreements and permits:

A building/construction permit from the City of Ormond Beach for the PV system installation must be acquired prior to filing an application with Florida Power and Light (FPL) for a net-metering agreement and a separate interconnection agreement. Proof of final inspection and project approval by the code official must be acquired prior to the FPL installing a bi-directional meter to tie the PV system to the FPL electric distribution system and enable net-metering.

5. Project Development Schedule. Describe the overall project development method, including the key project development activities and the proposed schedule:

Development Activity:

All design, engineering, permitting, agreements, and preparations for the existing building renovation, the addition, and the PV system installation are expected to be completed by the end of the 3rd quarter of 2016.

Proposed start date: 4/1/2016 Proposed end date: 9/30/2016

6. Equipment Procurement and Installation.

a. Describe the availability of the equipment required by the system, including its procurement and delivery schedules:

The project specifies Canadian Solar PV modules and SMA Inverters. Both are commercially available, eligible for sale and installation in Florida based on FSEC certification and approval as required by state statute, and readily available in the Florida marketplace. The PV contractor has existing relationships with suppliers and predicts 4-6 weeks for delivery.

b. Describe the plan for site development and system installation, including any special equipment requirements:

The existing building will undergo a renovation including a roof renovation that will provide adequate structural support for dead load and uplift for the site's wind born debris zone as well as appropriate attachment surfaces as determined by the required structural design by the professional engineer. Contingent on completion of the roof renovation and construction of a significant addition, PV system installation will commence. The contractor will provide all equipment necessary for installation.

7. Operations and Maintenance.

a. Describe the operations and maintenance requirements of the system, including major rebuilds and component replacements necessary over system's useful life:

Recommended maintenance includes an annual system inspection by qualified licensed contractor with attention to blown fuses, loose connections, poor production, and factors leading to production degradation. The PV panel (approximately 300 panels) warranty is typically 20-25 years with rated output capacity 80% of rated nameplate efficiency. For the inspection, a full day for one contractor at $50/hour is $400. The system will have four Sunny Tripower 24kW inverters. Inverters typically have a 7 year warranty. At replacement, higher efficiency inverters will likely be available, improving system production.

b. Warranties provide protection against both breakdown and degradation of performance: ■ Yes ☐ No

c. Describe how the system will be monitored for performance:

The Sunny Tripower inverters include an online dashboard, Sunny Portal (https://www.sunnyportal.com) accessible by wireless connection. The inverter sends production data to Sunny Portal providing building owners with the ability monitor actual daily power production and address degradation quickly. Daily data can be compiled to compare annual production.

month. If it exceeds the monthly energy use, that energy produced is credited toward a future monthly bill in the same calendar year. This is referred to by FPL as "banking". In the last billing cycle month of each calendar year (December) all excess energy (accrued as kilowatt-hours) in the "bank" will be settled to the Business's account as a credit at the annual average "as available rate" which is variable and less than the retail rate. The cost-effectiveness of adding capacity beyond that projected level is impossible to calculate because of the variable nature of the "as available rate".

Applicant should initiate communications by contacting FPL Net Metering (305)552-2275, 14250 SW 112th St., Miami, FL 33186. The following list of requirements was aggregated from multiple documents available on their website. The documents are included in Appendix E for reference.

1. Establish an account with FPL
2. The customer on the account must complete a net-metering application, interconnection agreement, obtain a building permit, submit proof of insurance, and pay an application fee to FPL. Among other requirements, the customer must provide an electrical one-line diagram and specification sheets for the inverter, renewable energy source and other installed equipment, such as PV panels. The PV installer is familiar with and prepared to provide required documentation.
3. Once PV installation is complete, customer submits a copy of the final permit showing the system approved and signed off by the local code authority.
4. For Tier 3 systems, FPL will install a bi-directional meter within 10 days.

## Section C and C.2 Solar Resource Assessment

As mentioned, the audit team focused on the existing building to assess the veracity and reliability of the contractor's method and results for sizing, projected annual energy generation, and specifications. The audit team visited the site on March 31, 2016 and conducted an assessment of solar resource availability for the existing building. Without access to roof height of the planned addition, a direct assessment of solar resource could not be conducted. However, site shading conditions to the north of the existing building are similar and a similar level power production would be expected.

### Equipment Information (V.B, p.3)

The quote for proposed renewable energy system from [redacted] is included in Appendix B. Additional information was provided to the project team[6] in a recent email stating that the installed system will total approximately 150 kWdc consisting of 470 Canadian Solar 320 watt modules (CSGX - 320P), six Sunny Tripower 24000TL-US (SMA) inverters, and associated components for a complete roof-top, grid-tied PV system mounted on an open frame rack. The solar system mounting is designed for a minimum 140 mph

[6] Email communication on April 21, 2016 at 12:04 PM from [redacted]

structural wind load to meet applicable Florida building codes. The solar modules are tested and certified by the Florida Solar Energy Center as required by State of Florida statute. The solar power inverters are UL Listed and appropriately sized for the system.

**Equipment Certification (V.D, p4)** The solar modules are tested and certified by the Florida Solar Energy Center, a recognized industry organization whose certification standards are acceptable to the Rural Business-Cooperative Service.

## Data Source for Renewable Energy Resource Assessment (VI.B.2, p.7)

The existing building roof is sloped at a 10 degree angle from a central ridge dividing the roof into two halves – one tilted toward the east ("east roof") and one tilted toward the west ("west roof"). There are two industry-accepted methods of solar resource assessment: Solar Pathfinder and Solmetric SunEye. This assessment was conducted with Solmetric SunEye which is a site-specific evaluation device or site survey tool (VI.3) paired with TMY3 weather data for analysis in the Solmetric software.

Nine skyline photos were taken on each half to assess access at the front, center, and back of the building at the east edge, the midpoint between the edge and the ridge, and at the ridge. Solmetric Solar Access and Shade Reports are included in Appendix F – one for the roof surface tilted east and one for west as well as photos of the site.

## Quality of Renewable Energy Resource (VI.B.2, p.7)

The quality of solar access on the roof of the existing building is excellent. The SunEye device takes panoramic skyline photos that document surrounding site features and the shadows cast on the roof at the time of assessment. Solmetric software overlays the skyline photos with latitude-specific sun-path diagrams to produce both a visual representation and computational analysis of shading conditions at all hours for all day of the year. The calculations are used to assess the roof's access to solar radiation on a monthly basis and an average annual solar. That number is compared to the maximum possible access to calculate an *annual percentage of solar access* for the subject roof.

The industry-accepted optimum *annual percentage of solar access* is 90% meaning 90% of the maximum possible solar energy for the location between solar time 9 am to 3 pm will reach the subject roof. The Solmetric Solar Access and Shade Report for the east sloping side of the roof documents 90% annual solar access and for the west sloping roof slightly less at 81% annual solar access (Figure 4). The average annual solar access is 85.5% considering both sides of the roof - only 5% lower than the optimum. The existing building roof is an excellent candidate for PV. Photos of the roof are shown in Figure 5 and in Appendix F.

Some landscape removal is intended as part of the overall project; that will increase solar access, however these calculations are done with the existing shading as-found.


*Figure 4 – Solmetric Solar Access Summaryfor nine skylines photos for the east facing roof (left) and nine skylines photos for the west facing roof (right) shows 90% and 81% annual solar access respectively (red circles) for an average of 85.5%*

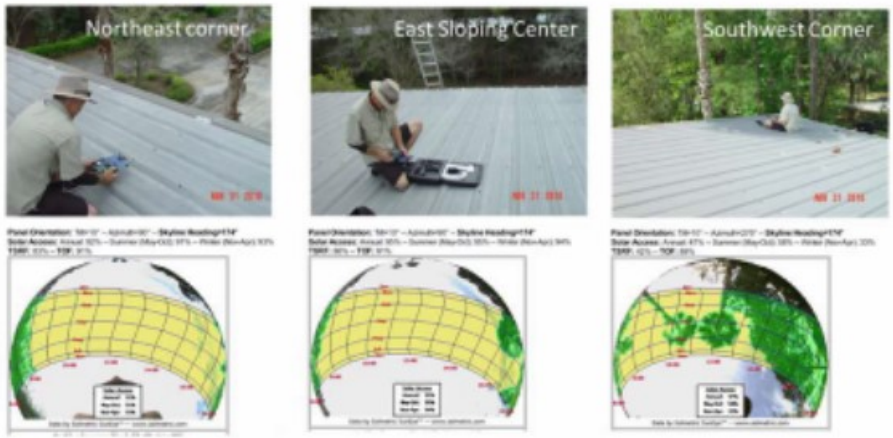



***Figure 5: Roof line with skyline photo looking northeast (left), east (center), and shading at the southwestern corner (right) which is expected to be eliminated, enhancing solar access.***

## Quantity of Renewable Resource Available (VI.B.2, p.7)

Based on the project location, existing building roof area (allowing for intra-row spacing, and skylights removal in the roof renovation), and the amount of solar access, a maximum system size for the existing building is found to be approximately 108.6 kWdc. This is slightly higher than the PV contractor's more conservative system size at 97.9, in part because the contractor did not know that the skylights would be removed. The gain in roof area would accommodate an additional 28 panels – adding 8.5 kWdc for a total of 106.4 kWdc which is very much in-line with the maximum available. Considering that the planned addition will nearly double the size of the available roof area, the additional 52.5 kWdc array can be accommodated easily.

## Projected Annual Amount of Renewable Energy to be Generated and Simple Simple Payback

The U.S. Department of Energy's National Renewable Energy Laboratory's developed and maintains the PVWatts calculator (http://pvwatts.nrel.gov/), an online tool that is an industry-

accepted method of estimating PV energy production based on location, module and array type, system losses, roof pitch, solar orientation, and dc to ac size ratio, and inverter efficiency.

A 108.6 kWdc system (theoretical maximum) would produce approximately 128,012 kWh or 128 megawatts annually based on NREL's PVWatts calculations using *typical industry-accepted system characteristics* and TMY3 weather data for Daytona Beach International Airport (Appendix G - PVWatts Reports). Referring to the detailed calculations on page 2 of the quote, FSEC finds this is in-line with the PV contractor's projection of 142,055 kWh or 142 megawatts annual production which is based on *the known performance criteria of the selected PV module and inverter*.

While the quote does not take into account the roof area gained from skylight removal, neither does take into account the existing tree shading. The former would increase the contractor's predicted production while the latter would reduce it for an overall effect of little change.

***Annual Amount of Renewable Energy to be Generated (V.E.2.a.i, p.4)***: In essence, this third party assessment independently corroborates the calculations provided in the PV contractor's quote for the existing building and recommends accepting the contractor's projected annual energy production on the cover page of the quote for the whole system of 218,189 kWh/year for the USDA REAP grant application Item V.E.2.a.i. and for calculating the percent of energy replacement and simple payback.

***Annual percentage of energy being replaced (V.E.2.a.iii, p.4)***: The percent of energy replacement is calculated by dividing the projected production (referred to as "energy replacement" in the application) to the projected annual energy use from the utility bill analysis:

| | | | | | | |
|---|---|---|---|---|---|---|
| **Annual Percent of Energy Being Replaced** | = | Projected Annual Renewable Energy Production* / Projected Annual Energy Use** | = | 218,189 kWh / 512,830 | = | **42%** *(V.E.2.a.iii, p.4)* |

**From quote (corroborated by independent analysis). Application ItemV.E.2.a.i, p.4*
***From utility bill analysis. Application Item V.E.2.a.ii, p.4*

***Value of Energy to be Replaced and Simple Payback***: The value of energy to be replaced is found to be $ $30,546 by multiplying the projected annual production by the simplified cost of energy per unit:

| | | | | |
|---|---|---|---|---|
| **Value of Energy to be Replaced Annually (Energy Replacement)** | = | Projected Annual Renewable Energy Production* | X | Simplified Cost of Energy per kWh** |
| | = | 218,189 kWh | X | $0.14/kWh |
| | = | $30,546 *(V.E.4.a and d, p.4 AND V.E.6, p.5)* | | |

**From detailed calculation in the quote, corroborated by this independent analysis using PVWatts.*
***From utility bill analysis. Application Item V.E.3.a., p.4*

To calculate the simple payback for the PV system for the existing building is found to be 14.4 years by comparing the proposed installed first cost to the value of energy to be replaced annually (energy replacement).

$$\text{Simple Payback} = \frac{\text{Proposed Installed First Cost*}}{\text{Value of Energy to be Replaced Annually}} = \frac{\$440{,}600}{\$30{,}546} = \textbf{14.4 years}$$ *(V.E.9.a, p.5)*

**From cover page of quote, extrapolated as 65% of overall system cost*

## Section D Design and Engineering (V.B, p.3)

To ensure public safety, Florida statute requires that all PV systems installed in the state of Florida must have design approval from the Florida Solar Energy Center; therefore, there is a thorough independent review of all design and engineering parameters and specifications prior to permitting. Additionally, all solar energy systems manufactured or sold in the state must meet the standards established by the Florida Solar Energy Center and display accepted results of approved performance test[7]. All solar power inverters are UL listed.

The PV system design shall serve only the power needs of the business with interconnection to grid for any excess power production. As Florida statute requires, the PV system mounting is designed for a minimum 140 mph structural wind load to meet applicable Florida building codes. Design shall take into account all requirements of local codes, interconnection agreements, power production agreements, or like that are required for system operation.

Electric grid connections are highly regulated. FPL executes the grid connection and ensures all disconnects and controls are adequate to ensure public and utility worker safety.

All components of the proposed PV system are commercially available and eligible for sale and installation in Florida based on FSEC certification and approval as required by state statute. The proposed panel module is CSGX - 320P (Canadian Solar). Example procurement site: https://www.civicsolar.com/product/canadian-solar-quartech-maxpower-cs6x-320p-320w-poly-slvwht-1000v-solar-panel.

The proposed inverter is Sunny Tri power 24000TL·US (SMA). Example procurement site: https://www.civicsolar.com/product/sma-sunny-tripower-24kw-tl-1000-vdc-480-277-vac-wye-transformerless-inverter-w-swdm-us-10-st

## Section E Project Development

See schematic project scheduling strategy below. The basic intent is to renovate the existing building with PV system installation commencing as soon as possible after the roof renovation is complete. Concurrent planning and execution of the addition will culminate with PV system installation/expansion.

### Schematic Project Scheduling Strategy (VI.B.5, p.7):

2016, 2nd and 3rd quarters (May-October), concurrent development activities

[7] Florida Administrative Code,CHAPTER 6C7-8, FLORIDA SOLAR ENERGY CENTER PROGRAM https://www.flrules.org/gateway/ChapterHome.asp?Chapter=6C7-8

- Project financing procurement completed
- All design, engineering, and permitting, for the renovation of the existing building and the planned addition completed.
- Renovation and construction begun.
- PV System preparation (concurrent):
  - Engineering/design for the PV system (3 weeks)
  - PV system equipment procurement by [redacted]t (4-6 weeks for delivery)
  - Obtain building permit from the City of Ormond Beach for the existing building PV system (3 weeks)
- Submit net-metering agreement and interconnection agreement to Florida Power & Light, the local electric utility (3-4 weeks)
- Contingent on completion of roof, begin and complete PV system installation (in series):
  - Site preparation and material staging (1 week)
  - Solar racking installation (1 week),
  - Solar module installation (2 weeks)
  - Power Inverter installation (1 week)
  - System start up, activation, inspection and sign off (1-3 weeks, depending on inspector work load and inspection results)
  - Work with FPL to complete connection of the 97.9 array to the electric grid (1 week after proof of inspection and approval is submitted)

## Section F – Equipment Procurement and Installation (VI.B.6, p.8)

**Availability of the Equipment (VI.B.6.a, p.8)** The project specifies Canadian Solar PV modules and SMA Inverters – both are readily and widely available and in common use in the marketplace throughout Florida. The PV contractor has ready access and existing relationships with suppliers. The following online resources attest to general availability:

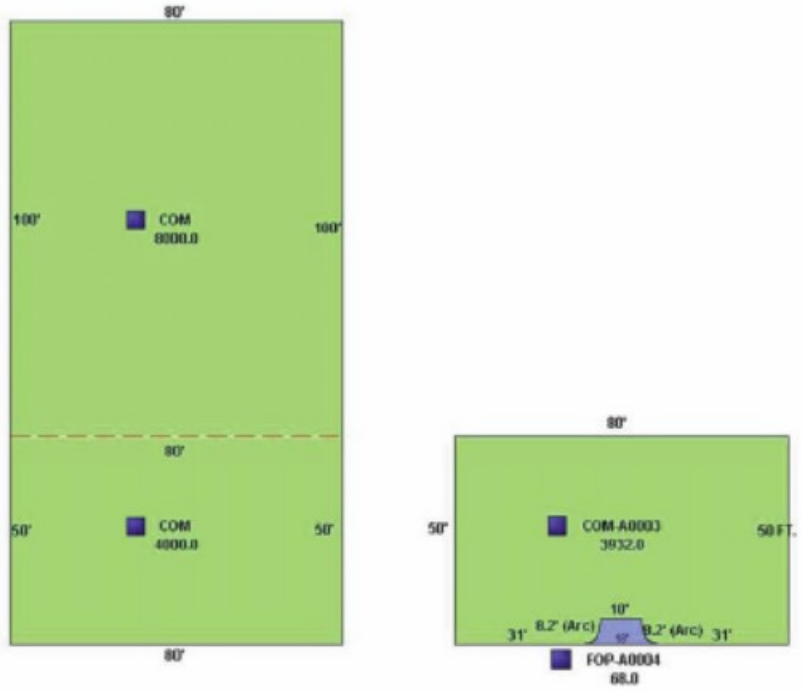
- Canadian Solar PV modules procurement site: https://www.civicsolar.com/product/canadian-solar-quartech-maxpower-cs6x-320p-320w-poly-slvwht-1000v-solar-panel
- Example SMA Inverter procurement site: https://www.civicsolar.com/product/sma-sunny-tripower-24kw-tl-1000-vdc-480-277-vac-wye-transformerless-inverter-w-swdm-us-10-st

### Site Development and System Installation (VI.B.6.a, p.8)

The existing building will undergo a renovation including a roof renovation that will provide adequate structural support for dead load and uplift for the site's wind born debris zone as well as appropriate attachment surfaces as determined by the required structural design by the professional engineer. Contingent on completion of the roof renovation, PV system installation will commence. The contractor will provide all equipment necessary for installation

## Appendix C - Slide show from a previous audit presented at the June 2016 workshop


Ormond Beach – 16,000 ft$^2$ Industrial Building
Offices in front – upstairs and downstairs
Warehouse/shop in back – currently divided, planning to consolidate





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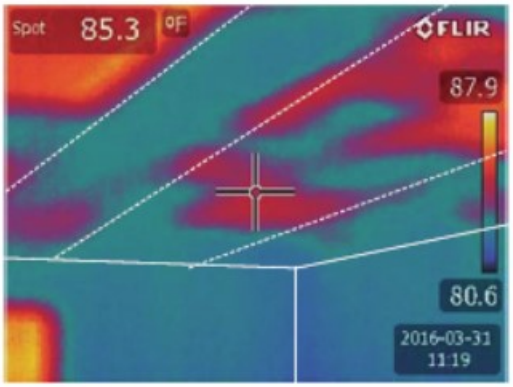
Ormond Beach – 16,000 ft² Industrial Building
Offices in front – upstairs and downstairs
Warehouse/shop in back – currently divided, planning to consolidate

Replacing 3 and servicing 5 existing HVAC systems. New digital thermostats With improved energy management capability


Infrared inspection of insulation – ceiling above acoustic tile drop ceiling







**Energy Efficiency Improvements**

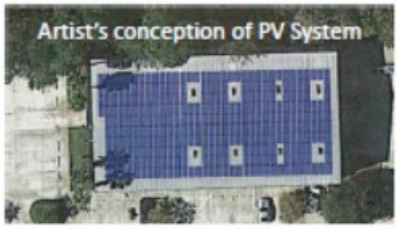
Servicing 5 HVAC units
Replacing 3 worn out SEER 13
HVAC units with SEER 19

Replacing worn out double=pane
Clear windows with
Double pane, low-e windows

Roofing over existing screw down
Metal roofing with
"hugger" Roof system –
integrated R-30 insulation
and white reflective finish

**Energy Efficiency Improvements, *continued***

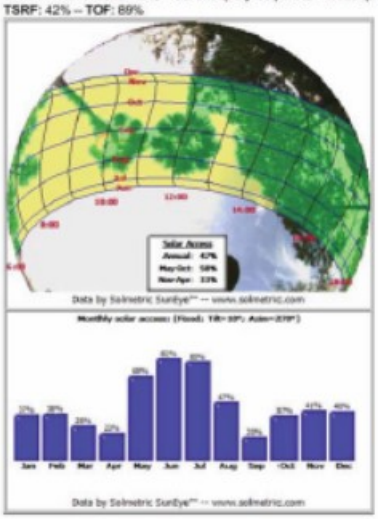
Office- Replacing T-12 Magnetic Ballast, 4-lamp Fixtures, prismatic lens with new T-8, Electronic Ballast, 2-lamp fixtures, parabolic lens.
Shop – Replacing sodium lamp fixtures with High Bay LED fixtures




Large Grid-tied
Solar Electric
(Photovoltaic (PV))
Array

Correcting various defects in
ceiling insulation and
Wall to ceiling assembly






Preliminary Energy Audit Report for decision making.
Final Energy Audit Report with text to cut and paste into REAP application

| Improvement | | Detail | Simple Payback (years) | Estimated Cost | Yearly Cost Savings | Total Available Funding | Federal Tax Credit* | Consumers Energy MPwES Rebates | Energy Savings | Carbon Dioxide CO2 Reduction (ton/year) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Air Infiltration | Seal Air Leaks Around Windows and Switch Plates | **1.7** | $300 | $45 | **$225** | - | $225 | 1.5% | 0.34 |
| | LED Lighting | Replace Incandescent Light Bulbs | **1.9** | $500 | $263 | **$0** | - | - | 8.7% | 2.02 |
| | Low Flow Shower Head | 1.75 gal/min shower head** | **4.2** | $50 | $12 | **$0** | - | - | 0.4% | 0.09 |
| | Rim Joist | Air Seal and Insulate with R-18 Spray Foam | **6.2** | $750 | $86 | **$220** | $45 | $175 | 2.9% | 0.66 |
| | Exterior Walls | Injection Foam R-18 | **9.9** | $4,300 | $380 | **$583** | $258 | $275 | 12.6% | 2.91 |
| | Attic Insulation | Hot Roof R-22 Spray Foam on Roof deck | **17.8** | $5,000 | $239 | **$750** | $300 | $450 | 7.9% | 1.83 |
| | Refrigerator | ENERGY STAR Rated Refrigerator | **21.5** | $1,200 | $54 | **$40** | - | - | 1.8% | 0.41 |
| | Energy Efficient Hot Water Heater | Tankless 0.98EF ENERGY STAR Rated | **25.1** | $2,800 | $97 | **$368** | $168 | $200 | 3.2% | 0.74 |
| | Dishwasher | ENERGY STAR Rated Dishwasher | **28.1** | $450 | $16 | **$0** | - | - | 0.5% | 0.12 |

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A Research Institute of the University of Central Florida